DOCUMENT RESUME

ED 022 025 VT 005 212

MANPOWER FORECASTING THROUGH THE OCCUPATIONAL NEEDS SURVEY.

Rutgers, The State Univ., New Brunswick, N.J. Inst. of Management and Labor Relations.

Note- 45p.

EDRS Price MF-$0.25 HC-$1.88

Descriptors- *EMPLOYMENT PROJECTIONS, *EVALUATION, MANPOWER NEEDS, *OCCUPATIONAL SURVEYS, RESEARCH METHODOLOGY

Identifiers- New Jersey

To test the efficacy and validity of measuring future manpower needs by means of an employer survey, employer predictions of employment needs as reported in the 1960 Area Skills Surveys, done by the New Jersey Division of Employment Security, were compared with actual employment reported in the Occupational Training Needs Survey conducted in the Newark Labor Market Area in late 1963. The 1963 survey provided data from 337 of 604 employers contacted on September 1963 employment and estimated expansion needs as of September 1965 and September 1968. On a followup form in the fall of 1965 showing their estimated September 1965 employment, 302 respondents indicated actual September 1965 employment, and checked reasons for any discrepancy between the two. Data suggested that, in overall terms, estimates of changes in total employment were reasonably accurate. It was concluded that the estimates collected in 1963 might have served with other available information provide as solid a basis for occupational manpower needs as might be wished, the imperfect estimate was better than none. Improvements would require more personal contact with respondents and would increase costs on an already costly survey, but the enhanced accuracy might make the effort worthwhile. (MM)

C1

COMPLIMENTARY COPY

RESEARCH SECTION
INSTITUTE OF MANAGEMENT AND
LABOR RELATIONS

MANPOWER FORECASTING through the occupational needs survey

RESEARCH SECTION
INSTITUTE OF MANAGEMENT AND LABOR RELATIONS
UNIVERSITY EXTENSION DIVISION
RUTGERS – THE STATE UNIVERSITY

ED022025
VT005212

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

RESEARCH LIBRARY
THE CENTER FOR VOCATIONAL
AND TECHNICAL EDUCATION
THE OHIO STATE UNIVERSITY

RESEARCH SECTION

INSTITUTE OF MANAGEMENT AND

LABOR RELATIONS

MANPOWER FORECASTING through the occupational needs survey

RESEARCH SECTION
INSTITUTE OF MANAGEMENT AND LABOR RELATIONS
UNIVERSITY EXTENSION DIVISION
RUTGERS — THE STATE UNIVERSITY New Brunswick, N.J.
SEPTEMBER, 1966

Acknowledgements

This study would not have been feasible without the co-operation of the New Jersey Division of Employment Security, and particularly that of Mr. Walter Chartier and Mr. Al Davis of the Division's Bureau of Statistics and Research. Mrs. Estelle Blostein assisted in the processing and tabulation of data. However, the interpretations and conclusions are solely the responsibility of the undersigned.

Jack Chernick, Chairman
Research Section
Institute of Management
and Labor Relations

September, 1966

TABLE OF CONTENTS

		Page
I	Introduction	1
II	Findings	8
	Predicted Expansion Needs	13
	The Quality of Employer Response	17
	Reasons for Inaccurate Forecast	23
III	Summary and Conclusions	26
	Appendix	31
	A - Questionnaires	31
	B - Employment By Occupation and Industry for September, 1963	41

LIST OF TABLES

Number		Page
1.	Skill Surveys Conducted In New Jersey, 1960 to 1963	2
2.	Summary of Company Responses To Follow-Up Study	5
3.	Employment Changes By Industry, Newark Labor Area and Sample Survey Compared September, 1963 to September, 1965	7
4.	Actual Employment Compared With Predicted Employment for September, 1965 And With Employment In September, 1963 By Industry Group 302 Establishments In Newark Labor Area	9
5.	Employment In September, 1963 And Predicted And Actual Employment In September, 1965 By Major Occupational Classifications	10
6.	Predicted And Actual Employment Compared By Major Occupation And Industry Groups	12
7.	Predicted And Actual Changes In Number of Employees Between September, 1963 And September, 1965 For Selected Industry Groups, By Major Occupational Classifications	15
8.	Employment Changes In Selected Occupations September, 1963 to September, 1965	18
9.	Number And Median Size Of Employment In Establishments By Industry, Classified According To Whether Or Not Predictions Were Made	21
10.	Reasons For The Difference Between Expected And Actual Employment As Of September, 1965 And Number Of Employees Affected	24
A.	Employment By Occupation And Industry For September, 1963 Predicted And Actual, September, 1965	42

MANPOWER FORECASTING THROUGH THE OCCUPATIONAL NEEDS SURVEY

I

INTRODUCTION

Beginning in July, 1960 the N.J. Division of Employment Security launched a series of Area Skills Surveys designed to disclose expected manpower needs of employers in the various labor market areas of New Jersey.

The primary purpose of the surveys, as explained to employers, was to determine existing and anticipated job opportunities and to compare these with the expected output of existing programs of training. The ultimate purpose, of course, was to achieve a greater equalization between demand and supply of manpower in the labor market.

In many ways, local Employment Service Offices can function efficiently only if future occupational needs can be anticipated. Counselling workers and advising employers interested in expanding in-plant training programs presuppose that Employment Service personnel know what is likely to occur in a particular labor market area. The Area Skills Survey is one device for accomplishing such forecasting. A list of the completed surveys is shown in Table 1. Based on information contained in the several survey reports, the table also indicates the extent of coverage of establishments.

TABLE 1

SKILL SURVEYS CONDUCTED IN NEW JERSEY, 1960 TO 1963

Area	Date of Survey	Number of Questionnaires Mailed	Number Returned	Percent Returned	Number of Employees Covered	Percent of Total Employment*
Newark	Sept., 1963	1,466	811	55	137,723	23
Paterson	July, 1960	---	---	73	---	37
Bridgeton, Vineland	March, 1962	274	246	66	---	--
Trenton	March, 1963	658	392	60	31,475	36
Perth Amboy, New Brunswick	Sept., 1961	800	517	60	76,526	42
Atlantic City	Nov., 1961	386	249	64.5	---	--
Long Branch	July, 1962	656	452	69	---	--
Lakewood, Toms River	March, 1962	286	193	67.5	---	--
Ocean City, Cape May, Wildwood	March, 1962	185	133	72	---	--
Camden	July, 1962	800	498	62	76,500	40
Jersey City	May, 1961	1,432	884	61.7	---	--

*The total does not include employment in government, railroads, mining, forestry, and fisheries.

Source: Reports of the New Jersey Division of Employment Security describing each of the several surveys. Only in the surveys shown were data presented with respect to the number and percent of employees covered.

How accurate are such forecasts? The present study attempts to provide a partial answer to this question by comparing employer predictions with actual employment. Selected for the test was the Occupational Training Needs Survey conducted in the Newark Labor Market Area in late 1963.* At that time a form** was sent to a sample of establishments with the request that employers record employment as of September, 1963 and estimate expansion needs as of September, 1965, and September, 1968. Respondents were also asked to indicate the number of replacements expected to occur within the two time periods and to indicate how many workers were at that time involved in in-plant training programs. They were asked to supply this information for the establishment as a whole and also for some fifty occupations. The occupations included were those generally in short supply and which reflected the area's occupational distribution. They were selected in advance following review of labor market reports of the Division of Employment Security and the local Employment Service offices.

In the present study the accuracy of the estimates supplied by employers was tested in respect to predicted employment as of September, 1965. In October of that year employers who had re-

---

*For a report on the survey see: Division of Employment Security, Department of Labor and Industry, State of New Jersey. Occupational Training Needs Survey : Newark Labor Market Area, 1964.

**A copy of the form appears in Appendix A

sponded to the original questionnaire were sent a follow-up form,* which reproduced their estimates of anticipated employment in September, 1965. Respondents were asked to indicate their actual employment in September, 1965 and to explain any differences between estimated and actual employment by checking one or more items in a list of possible reasons.

The survey conducted in 1963, consisting of 1,466 questionnaires mailed by the Division of Employment Security, yielded 811 returns. In the present study all establishments with more than ten employees and one-tenth of those with ten or fewer employees received follow-up forms. Thus a total of 604 questionnaires were mailed between October 15 and December 31, 1965. In the case of nonrespondents follow-up letters were sent. In addition, by means of telephone calls employers were urged to complete and submit the forms.

A summary of the response rate is indicated in Table 2. It shows that some 50 percent of all the questionnaires sent out were returned. In terms of size of employment as of September, 1963, the follow-up survey accounted for some 77 percent of the work-force covered in the original survey. However, it should be noted that the original survey, which yielded data for approximately 138,000 workers in the area, covered only 23 percent

---

*A copy of the form appears in Appendix A

of the area's wage and salary employment, exclusive of government, railroads, mining, forestry, and fisheries.

TABLE 2

SUMMARY OF COMPANY RESPONSES TO FOLLOW-UP STUDY

	Number of Establishments		
Original Survey (Sept. 1963)	Ten Employees or less	More than Ten Employees	Total
Questionnaires returned	240	571	811
Employees covered			137,723
Follow-up Survey (Sept. 1965)			
Questionnaires mailed	36	568	604
Questionnaires returned	19	318	337
Usable questionnaires (total)	15	287	302
Employees covered			102,025
Percent of number mailed	42%	51%	50.0%
Percent of employees covered in original survey			76.7%

* * * *

The distribution of returns in the follow-up survey shows considerable variation in the success with which the several industry groups were sampled. Table 3 compares the changes in employment by industry group in the sample returns with those in the Area as a whole. It will be noted that in some cases the sample statistics diverge substantially from the figures for the Area as a whole. This is true of construction and trade, both wholesale and retail. In the contract construction industry, sample establishments showed a rate of increase in employment approximately twice as great as that for the industry as a whole; in retail trade, our sample suggested an actual

decline in employment while the total for the industry increased by 6.5 percent in the period September, 1963 to September, 1965. These results are partly explained by the low sampling ratios in these industries. The final column in Table 3 indicates that as of September, 1965, only 3.4 percent of employees were covered by sample returns in construction and wholesale trade, and only 6.8 percent in retail trade. In contrast, sampling ratios in the other industry groups ranged from 14.6 percent in the service industries to 41.2 percent in transportation, communication, and public utilities.

TABLE 3

EMPLOYMENT CHANGES BY INDUSTRY, NEWARK LABOR AREA AND SAMPLE SURVEY COMPARED
SEPTEMBER, 1963 TO SEPTEMBER, 1965
(numbers in thousands)

	NEWARK LABOR AREA				SAMPLE SURVEY				
	Sept., 1963* (1)	Sept., 1965* (2)	Increase Number (3)	Increase Percent (4)	Sept., 1963 (5)	Sept., 1965 (6)	Increase Number (7)	Increase Percent (8)	Sample in Percent of Universe Sept., 1965 (9)
Manufacturing	240.2	248.6	8.4	3.5	43.1	44.3	1.2	2.8	17.8
Contract Construction	30.3	35.4	5.1	16.8	.9	1.2	.3	33.3	3.4
Transportation, Communications and Public Utilities	51.9	52.9	1.0	1.9	21.7	21.8	.1	0.5	41.2
Wholesale Trade	42.1	44.0	2.9	6.9	1.5	1.5	0	0.0	3.4
Retail Trade	90.7	96.6	5.9	6.5	6.8	6.6	-.2**	-2.9**	6.8
Finance, Insurance and Real Estate	47.5	49.2	1.7	3.6	12.4	12.7	.3	2.4	25.8
Service and Miscellaneous	104.8	113.7	8.9	8.5	15.7	16.6	.9	5.7	14.6
TOTAL	607.5	640.4	32.9	5.4	102.1	104.7	2.6	2.5	16.3

*Nonagricultural Payroll Employment. Newark Area 1958-1965. New Jersey Department of Labor and Industry, Bureau of Statistics and Records, Trenton, New Jersey. March, 1966.

**Decrease

II

FINDINGS

Clearly, if the goal of the Occupational Needs Survey was to estimate overall change in employment in the Newark Labor Area, the survey conducted in September, 1963 was highly successful. The data reproduced in Table 4 show that actual employment in September, 1965 in the 302 establishments constituting the sample was almost precisely what had been predicted in September, 1963. Employment in the two-year period increased by three percent; and allowing for some rounding of the figures, the change coincided with predictions made in September, 1963.

However, while of some value, the accuracy of the overall estimate is only of secondary importance. How useful the estimates are as guides in the formulation of manpower policies, in counselling and training programs, depends on the quality of prediction of future needs in given occupations. In this respect, too, the forecasting effort under review may be said to have met with some success; it achieved a reasonable level of accuracy in estimating employment by major occupational group in the 302 establishments. The last column in Table 5 shows actual employment in September, 1965 in percent of predicted employment for that date. The largest discrepancy occurs in the estimate for workers

TABLE 4

ACTUAL EMPLOYMENT COMPARED WITH
PREDICTED EMPLOYMENT FOR SEPTEMBER, 1965
AND WITH EMPLOYMENT IN SEPTEMBER, 1963
BY INDUSTRY GROUP
302 ESTABLISHMENTS IN NEWARK LABOR AREA

Industry	Employment Sept., 1965 in percent of Sept., 1963	Employment Sept., 1965 in percent of predicted employment
Manufacturing	103	98
Construction	137	127
Transportation, etc.	101	100
Wholesale Trade	100	104
Retail Trade	98	96
Finance and Real Estate	103	102
Service and Miscellaneous	105	104
All Industries	103	100

TABLE 5

EMPLOYMENT IN SEPTEMBER, 1963 AND
PREDICTED AND ACTUAL EMPLOYMENT IN
SEPTEMBER, 1965 BY
MAJOR OCCUPATIONAL CLASSIFICATIONS
(302 establishments in Newark Labor Area)

Occupation	Employment Sept., 1963	Employment, Sept., 1965 Predicted	Employment, Sept., 1965 Actual	Actual employment Sept., 1965, in percent of employment in Sept., 1963 (percent)	Actual in percent of predicted employment Sept., 1965 (percent)
Professional	8,090	8,244	8,566	106.	104.
Semi-professional	6,324	6,536	6,464	102.	99.
Managerial	7,238	7,359	7,390	102.	100.
Clerical	27,201	27,659	27,643	102.	100.
Sales	4,888	4,971	4,837	99.	97.
Skilled	14,914	15,295	15,053	101.	98.
Semi-skilled	17,171	17,396	18,108	105.	104.
Unskilled	12,855	13,690	13,416	104.	98.
Service	3,344	3,411	3,247	97.	94.
TOTAL	102,025	104,611	104,724	103.	100.

in service occupations, where total employment in September, 1965 was only 94 percent of anticipated employment. For the other occupational groups, the differences were in no case greater than 4 percent.

Table 6 expands the data presented in Tables 4 and 5 in order to show the variations within industry groups between actual and predicted employment in September, 1965. In a gross way these comparisons point to differences among the several industry groups in the ability of firms to forecast employment. At least they reflect the degree of overall stability or volatility in employment during the period studied. As might be expected, construction showed the greatest instability both in overall percentages and for the various occupational groups. Retail trade showed some decline in actual employment, a trend which is the reverse of the actual change in this industry in the Newark Labor Area. However, as will be recalled (see Table 4) our sample of employment in this industry was small--6.8 percent of employees fell into the sample--and no doubt even smaller in respect to proportion of firms.

One may raise the question of whether or not the level of accuracy of employment forecasting by firms was uniform for the several major occupational groups. In other words, was it to be expected that our respondents in given industry groups would tend to predict certain occupational changes with greater accuracy than others? A very rough measure of the variability in accuracy of prediction across occupational groups may be derived by calculating the average

TABLE 6

PREDICTED AND ACTUAL EMPLOYMENT COMPARED, BY MAJOR OCCUPATION AND INDUSTRY GROUPS
(302 establishments in the Newark Labor Market Area,
September, 1963 to September, 1965)

Occupation	Manufacturing		Construction		Transportation		Wholesale Trade		Retail Trade		Finance and Real Estate		Services and Miscellaneous	
	(1)*	(2)**	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Professional	97	93	152	140	100	98	107	107	96	96	92	91	110	110
Semi-professional	99	93	120	106	99	98	83	83	98	88	121	116	103	102
Managerial	104	100	126	120	103	102	96	98	101	101	92	91	113	110
Clerical	97	92	158	145	100	100	96	93	99	97	107	105	100	99
Sales	107	101	60	60	120	120	105	107	91	92	160	150	110	104
Skilled	99	96	131	129	101	101	93	91	113	103	103	102	94	92
Semi-skilled	107	105	77	68	99	99	98	120	122	110	83	93	103	100
Unskilled	106	97	140	126	99	92	110	106	96	96	77	77	120	120
Service	91	85	---	---	97	97	100	100	102	100	110	110	102	98
TOTAL	103	98	137	127	101	100	99	104	98	96	103	102	105	104

*(1) Employment, September, 1965, in percent of employment, September, 1963.

**(2) Actual Employment, September, 1965, in percent of predicted employment for that date.

deviation of estimates. When this is done for the data in each column marked (2) in Table 6, the following average deviations are derived:

All Industries	2.4
Manufacturing	5.0
Construction	22.5
Transportation	4.2
Wholesale Trade	8.3
Retail Trade	4.8
Finance and Real Estate	13.2
Service and Miscellaneous	6.2

Interpreted, these figures indicate that the predictions of sample firms in the transportation, communications, etc., industry group were distributed with considerable uniformity across the major occupation groups. On the other hand, firms in the construction industry tended towards extreme deviations in some of their predictions. Thus, for the construction industry as a whole actual employment in September, 1965 was 127 percent of predicted employment. But the estimates ranged from 145 percent for clerical workers to 60 percent for sales workers. To be sure, the index is very gross; no attempt was made to weight the differences, although a cursory examination of the figures suggests that the ranking of industries would not be different.

Predicted Expansion Needs

Analysis of findings to this point has focused on overall employment change in the Newark Labor Area as suggested by sample returns from 302 establishments. The crucial question confronting

manpower officials, however, is phrased in terms of the number of openings likely to occur in a particular occupation or occupation group within a given period. Indeed, the question, framed in this way has been a guide to the organization of training programs under the Manpower Development and Training Act. What do the findings of the present survey disclose with respect to the accuracy and usefulness of the Occupational Training Needs Survey as a guide to such decisions?

In Table 7 are shown the predicted job openings expected to occur over the two year period in major occupational groups and the actual change in employment during the same period. Results are indicated for the 302 establishments taken as a whole as well as for the two industry groups for which sampling ratios were reasonably high: manufacturing and transportation, communications and public utilities.

As an overall guide to occupational needs in the Newark Labor Area, the predictions might be considered reasonably useful, with allowances made for the utilization of other relevant manpower information. For example, sample establishments employed more professional workers in September, 1965 than they had expected to employ. Demand for professionals was generally known to be vigorous. Moreover, short-term public action at the local level or even at the level of the state is not capable of doing much to resolve disclosed shortages. To be sure a more accurate prediction in this case by disclosing the actual level of competition might have a

TABLE 7

PREDICTED AND ACTUAL CHANGES IN NUMBER OF EMPLOYEES BETWEEN SEPTEMBER, 1963 AND SEPTEMBER, 1965
FOR SELECTED INDUSTRY GROUPS, BY MAJOR OCCUPATIONAL CLASSIFICATIONS
(302 establishments in the Newark Area)

Occupation	ALL INDUSTRIES		MANUFACTURING		TRANSPORTATION, COMMUNICATIONS AND PUBLIC UTILITIES	
	Employment Change Sept. '63 to Sept. '65		Employment Change Sept. '63 to Sept. '65		Employment Change Sept. '63 to Sept. '65	
	Predicted	Actual	Predicted	Actual	Predicted	Actual
Professional	154	476	127	-67	4	1
Semi-professional	212	140	166	-33	4	-7
Managerial	121	152	88	88	6	72
Clerical	458	442	264	-181	20	25
Sales	83	-51	110	131	1	15
Skilled	381	139	288	-3	11	60
Semi-skilled	225	937	241	890	21	-24
Unskilled	835	561	739	485	58	-7
Service	117	-97	37	-54	0	-5
TOTAL	2,586	2,699	2,060	1,256	125	120

bearing on the actions of employers in recruitment and in internal manpower planning and allocation.

The predicted increase in clerical workers in the sample as a whole was almost exactly matched by the actual increase in employment over the two-year period. This disclosure, emerging from the original survey, was thus capable of supporting the wide-spread impression of continuing shortages in the clerical occupations. Somewhat difficult to explain but possibly due to sampling inadequacy is the decrease in clerical employees in manufacturing. Although not included in the figures shown in Table 7, it should be added that the major increase--just under 600--in clerical jobs occurred in the finance, real estate and insurance industry group.

It is, finally, of interest to note the sharp difference between predicted and actual employment in semi-skilled jobs. The difference may well be explained by the conjunction of forces operating in the labor market under conditions of an upsurge in demand. It appears that in the nation as a whole, the reduction in unemployment rates over the period under study was particularly marked for unskilled and semi-skilled workers. Skilled workers, in short supply, are stretched as far as possible, while expanded production needs are met by increasing the number of operatives. It will be noted from the figures presented in Table 7 that the major increase occurred in manufacturing.

It is of particular interest to examine the findings with respect to selected occupations known to have been in relatively

short supply during the two years covered by the present study. The figures presented in Table 8 indicate that, although in all cases some increase was predicted, sample firms employed fewer draftsmen, automobile mechanics, and tool and die makers in September, 1965 than they had two years earlier. On the other hand, as might be expected, the number of programmers employed at the end of the period substantially exceeded the estimate.

The Quality of Employer Response

The manpower survey with which the present study is concerned involved requesting employers to indicate employment in a given list of occupations as of September, 1963, and among other information, to supply estimates of employment two years later, that is, as of September, 1965. Understandably, in any sample of firms some will fail to supply all of the data requested. The question which is crucial for the validity and usefulness of the survey being tested is the following: How many and what proportion of firms surveyed failed to provide the requested two-year forecast? The technical procedure followed in tabulating returns was to extend the September, 1963 figure to September, 1965 whenever the estimate was omitted and could not be secured by telephone or follow-up. This procedure, if applied in a limited proportion of cases, is probably not serious; one could reasonably assume that the failure to forecast implies that no change is expected. However, if it is found necessary to make such automatic extension

TABLE 8

EMPLOYMENT CHANGES IN SELECTED OCCUPATIONS
SEPTEMBER, 1963 TO SEPTEMBER, 1965
(302 establishments in Newark Labor Area)

Occupation	Employment September, 1963	Employment September, 1965	
		Predicted	Actual
Draftsman	1,354	1,402	1,258
Programmer	258	275	423
Key Punch Operator	481	502	566
Stenographer	886	895	890
Auto Mechanic	532	544	513
1st Class Metalworking Machine Hand	629	648	660
Machinist	1,144	1,305	1,280
Tool and Die Maker	617	655	560

of current figures in a high proportion of the sample, one could argue that an almost equally useful forecast could be derived by extrapolation of data for the universe derived from existing sources but adjusted for conditions in a given labor market area as these are understood by local Employment Service officials.

As part of the test being attempted in the present study, the 302 establishments in the sample were classified in three groups as follows:

1. In at least one occupational category an entry showing an expected increase or decrease was made in the column provided for estimating employment in September, 1965. This was taken to indicate that the respondent had made an attempt to forecast employment.

2. Entries appeared in the forecast column which were identical with employment figures for September, 1963, which could be interpreted as implying no change; or, if no such entries appeared, there was some explanation indicating that the respondent had considered the question of forecasting, but decided that no change would occur; or, it was explained that no forecasting was possible.

3. No entries appeared, nor was an explanation provided; this is interpreted as implying that respondents were unable or unwilling to supply the requested forecasts.*

In cases which fell into categories two and three, where no entries appeared, editors repeated the employment figures for September, 1963. The distribution in Table 9 of sample establishments among the three categories discloses significantly that this procedure was necessary in 160 out of the 302 returns, or over half the cases constituting the sample. In 60 cases no clues were available to guide the decision that employment in September, 1965 could with confidence be assumed to parallel that of September, 1963.

The classification of firms into the three categories permitted some assessment of the assumption one might reasonably make that the larger firms would more frequently have developed manpower plans and would thus more frequently be found in category one. The assumption is supported in some industry groups but not in all, at least by the criterion of median size of firm. In manufacturing, for example, the average size of firms in category three is somewhat higher than in the other two. In the

---

*In an undetermined number of cases, persons who edited the returns communicated by telephone with respondents and determined that the absence of forecasts was meant to indicate that no changes were anticipated. These cases would thus fall into category two above rather than category three.

TABLE 9

NUMBER AND MEDIAN SIZE OF EMPLOYMENT IN ESTABLISHMENTS BY INDUSTRY, CLASSIFIED ACCORDING TO WHETHER OR NOT PREDICTIONS WERE MADE
(Newark Labor Area)

Industry	Expansion Needs Indicated for One or More Occupations		No Expansion Needs Indicated but Failure to Estimate Explained		No Estimates Attempted		Total	
	No. of Firms	Median Size of Employment	No. of Firms	Median Size of Employment	No. of Firms	Median Size of Employment	No. of Firms	Employment
Manufacturing	66	115	39	113.5	38	120	143	43,077
Construction	8	24.5	4	50.5	1	---	13	883
Transportation, Communications, etc.	10	197.5	5	17	1	---	16	21,662
Wholesale Trade	11	35	8	21.5	8	25.5	27	1,496
Retail Trade	18	35	15	14	5	26	38	6,793
Finance, Insurance and Real Estate	13	131	3	12	2	---	18	12,376
Services	16	85	26	25	5	26	47	15,738
TOTAL	142		100		60		302	102,025

transportation and communications industry group the establishment with the largest number of employees (over 10,000) was in category two, having indicated that no estimates by occupation were available. Also, the one firm in category three had almost 3,000 employees. In retail trade, the second largest firm in the sample (over 1,000 employees) was in category three. On the other hand, the largest firm in the sample from this industry (3,500 employees) did supply estimates for the target date two years later. In the service industries and in finance, insurance and real estate, the largest firms tended not to supply estimates that would serve the purpose of manpower forecasting.

In summary, of the 14 establishments in the sample with more than 1,000 employees, only six supplied the requested estimates; eight were in category three, having failed to make any response to this part of the questionnaire.

The conclusion appears warranted that the usefulness of the survey as a means of predicting manpower needs was drastically reduced by the failure of many firms, including many large ones, to supply considered responses to the request for forecasts of job openings in the listed occupations.

Reasons for Inaccurate Forecast

In an effort to explore the reasons for differences between expected and actual employment in September, 1965, employers were asked to check one or more of the following suggested causes whenever the figure they supplied for the latter date exceeded or fell short of the expected number of employees:*

Reasons for differences between actual and expected:

A. Business poorer than expected
B. Business better than expected
C. Technological changes
D. Qualified workers not available
E. Insufficient information to make accurate prediction
F. Other - please specify

If more than one reason, circle most important.

The number of firms ascribing reasons and distribution by type are shown in Table 10. Also shown are figures for the number of employees involved by broad industry group. It is worth noting that some 225 references were made ascribing differences in numbers employed to technological changes. Examination of the responses indicate that occupations most frequently involved were in the

---

*The follow-up survey form, it will be recalled, reproduced the data supplied by respondents in the original survey in 1963. Where no estimates had been made, the September, 1963 employment figures were entered. Thus, our respondents who fell into categories two and three of the classification discussed above were actually ascribing reasons for the noted change in employment rather than the difference between "expected" and actual employment in 1965.

TABLE 10

REASONS FOR THE DIFFERENCE BETWEEN EXPECTED AND ACTUAL EMPLOYMENT
AS OF SEPTEMBER, 1965 AND NUMBER OF EMPLOYEES AFFECTED

	Manufacturing	Construction	Transportation	Wholesale Trade	Retail Trade	Finance and Real Estate	Services	Total
Total number of firms	143	13	16	27	38	18	47	302
Total number of firms reporting	90	8	10	12	16	13	24	173
Number of Employees Affected								
A. Business poorer than expected	-1335	-23	-52	--	-3	-5	-31	-1249
B. Business better than expected	1899	190	64	87	164	23	762	3189
C. Technological changes	-328	-4	-278	-6	-399	-171	-34	-1220
D. Qualified workers not available	-109	-10	--	-2	-32	--	-104	-257
E. Insufficient information to make accurate prediction (net change)	-18	0	+2	-4	-5	-40	-16	-81
increase (+)								+2
decrease (-)								-83
F. Other (net change)	-278	-30	-33	13	-24	21	439	108
increase (+)								+473
decrease (-)								-365

unskilled and clerical classifications. Some reduction in employment was ascribed to the fact that qualified workers were not available. Interestingly, the largest number, 104, occurred in the service industries. Examination of the returns suggests that the occupations in which this factor was revelant were: secretary, clerk-typist, and plumber-pipe fitter.

Furthermore, it may be noted that a small number of respondents checked reason E--insufficient information to make accurate prediction--although as has been seen, a large number of firms failed in the original survey to offer any prediction of employment two years later.

Finally, some references were made to other reasons for differences. These included acquisition of a new company through merger, and closing part of a plant. One respondent noted that a construction project had just been terminated. Another referred to a "change in procedure," without indicating its nature, as cause for a reduction in employment; finally, one respondent ascribed a reduction in service workers to contracting out of maintenance functions.

III

SUMMARY AND CONCLUSIONS

Accurate forecasts of manpower needs in local labor markets are indispensable to the Employment Service in the performance of its primary responsibilities. But they serve equally pressing demands of educational agencies and those charged with planning economic development of areas; they also supply information needed by private firms concerned with manpower and production planning and with in-plant training. The formulation and refinement of instruments capable of ensuring accurate short-term and long-term projections thus become exceedingly important tasks.

In this brief report an attempt is made to test the efficacy and validity of measuring future manpower needs by means of an employer survey. The survey follows from the reasonable assumption that if one could amalgamate for a given market employer estimates of future needs for workers in key occupations, one could produce the necessary forecast of demand in the labor market area as a whole. But the assumption is valid only to the extent that employers in a given market (1) are adequately sampled and (2) are willing and able to perform the task of estimating future need.

In the present study, employers who responded to a request for information in September, 1963 were sent a follow-up form in the Fall of 1965 on which was reproduced their estimate of employment as of September, 1965. They were asked to indicate actual employment in September, 1965; and, where a discrepancy occurred between predicted and actual employment, to suggest an explanation for the discrepancy.

The data discussed in the report suggest that in overall terms, estimates of changes in total employment in the sample firms (302) were reasonably accurate. For all firms taken together the predicted and actual employment in September, 1965 almost coincided. However, as might be expected, net changes within industries and within occupations were much more variable. Policies based on the estimates would have been quite sound in respect to clerical occupations, would have overshot the mark in skilled occupations, and would have fallen significantly short in the case of the semi-skilled occupational group.

In sum, one may conclude that the estimates collected in the survey of September, 1963 might have served, in conjunction with other information available for the Newark Labor Market Area, as a reasonably useful instrument of policy.

Nevertheless, study of the ultimate base of the estimates leads to several reservations. In the first place, it seems clear that in a high proportion of the returns, including a number

from companies with large work forces, the failure of company officers to estimate future needs made it necessary for the survey staff to project September, 1963 data ahead for two years.

The findings of this study suggest that this did not provide as solid a basis for occupational manpower needs as one might wish. On the other hand, since no occupational breakdown of employment for the local area is available, it may be that this imperfect estimate is better than none.

A further difficulty arises in respect to the initial accuracy of the occupational data provided. Discussions with respondents in the course of the present study leave the impression that at least some of the figures supplied in the Fall of 1963 were collected without precision. The request that actual figures be supplied for September, 1965 and compared with the earlier estimates for that date in some cases evoked the plea that the basis for the occupational breakdown was not known, or was not clear to the person responsible for filling in the follow-up form. In several cases where respondents agreed to review the original occupational data, substantial revision appeared necessary.

The employer survey as a technique of projecting manpower needs by occupation is a costly instrument: however in the absence of alternative current sources of occupational data it may be necessary to use this technique. But the responsible agency must address itself to the need for enhancing its efficacy. The cooperation of employers is indispensable, expressed not only in

completing a questionnaire, but in supplying estimates based on some considered judgment of probable changes in employment and in occupational structure within the establishment. The data can be made more useful by ensuring that information supplied by employers is based on a uniform definition of occupations. Employers concerned with the impact of changes in an area need to be convinced of the value of aggregate data for the area as a basis for their own planning. Perhaps the presence of employers on advisory groups would make it easier to promote such acceptance.

These improvements require more personal contact with respondents and would probably increase survey costs. To some extent these could be reduced by developing more rigorous yet smaller samples. But even if the additional cost initially cannot be offset, the enhanced accuracy might make the effort worthwhile.

APPENDIX A

Questionnaires

RS-152 (8-63)

State of New Jersey
Department of Labor and Industry
DIVISION OF EMPLOYMENT SECURITY
NEW JERSEY STATE EMPLOYMENT SERVICE
Affiliated with United States Employment Service

AREA SKILL SURVEY NEWARK LABOR MARKET AREA

TO BE RETURNED TO BUREAU OF RESEARCH AND STATISTICS BY OCTOBER 1, 1963

SYMBOL _____
(For State Agency Use)
CONFIDENTIAL
(Follow Attached Instructions)

LINE NUMBER	SECTION A. ALL EMPLOYMENT NUMBER OF EMPLOYEES ON ALL PAYROLLS					
	PAYROLL PERIOD ENDING ON OR NEAREST SEPTEMBER 15, 1963		PREDICTED FOR SEPTEMBER 15, 1965		PREDICTED FOR SEPTEMBER 15, 1968	
	TOTAL I	FEMALE II	TOTAL III	FEMALE IV	TOTAL V	FEMALE VI
1						

NAME _____ TITLE _____
(To be signed by person completing form)

LINE NUMBER	SECTION B. OCCUPATIONAL TITLES I	SEPT. 1961 EMPLOYMENT II	CURRENT EMPLOYMENT		EXPANSION NEEDS				REPLACEMENT NEEDS				NUMBER EXPECTED TO COMPLETE IN-PLANT TRAINING IN SEPT. 1965-SEPT. 1968	
					SEPTEMBER 1965		SEPTEMBER 1968		SEPTEMBER 1965		SEPTEMBER 1968			
			TOTAL III	FEMALE IV	TOTAL V	FEMALE VI	TOTAL VII	FEMALE VIII	TOTAL IX	FEMALE X	TOTAL XI	FEMALE XII	TWO YEARS XIII	FIVE YEARS XIV
1	Total Professional												XXXX	XXXX
2														
3	Total Lines 4 - 12													
4	Draftsman													
5	Electronics Technician													
6	Laboratory or Chemist Assistant													
7	Nurse, Practical													
8	Programmer													
9	All Other Semiprofessional													
10														
11														
12														
13	Managerial												XXXX	XXXX
14														
15														

RS-152 (8-63) (CONTINUED)

AREA SKILL SURVEY NEWARK LABOR MARKET AREA

TO BE RETURNED TO BUREAU OF RESEARCH AND STATISTICS BY OCTOBER 1, 1963

SYMBOL _____
(For State Agency Use)
CONFIDENTIAL
(Follow Attached Instructions)

LINE NUMBER	SECTION B. (CONTINUED) OCCUPATIONAL TITLES	SEPT 1961 EMPLOYMENT	CURRENT EMPLOYMENT		EXPANSION NEEDS				REPLACEMENT NEEDS				NUMBER EXPECTED TO COMPLETE IN-PLANT TRAINING IN SEPT. 1965-SEPT. 1968	
					SEPTEMBER 1965		SEPTEMBER 1968		SEPTEMBER 1965		SEPTEMBER 1968			
			TOTAL	FEMALE	TOTAL	FEMALE	TOTAL	FEMALE	TOTAL	FEMALE	TOTAL	FEMALE	TWO YEARS	FIVE YEARS
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
16	Total Lines 17 - 25													
17	Bookkeeper													
18	Bookkeeping Machine Operator													
19	Clerk-Typist													
20	Key Punch Operator													
21	Secretary													
22	Stenographer													
23	Tabulating Machine Operator													
24	All Other Clerical													
25														
26	Sales													
27														
28	Total Lines 29 - 57													
29	Automobile Body Repairman													
30	Automobile Mechanic													
31	Baker													
32	Brick Layer													
33	Carpenter													
34	Cutter, Hand													
35	Cylinder Pressman													

RS-152 (8-63) (CONTINUED)

AREA SKILL SURVEY NEWARK LABOR MARKET AREA

TO BE RETURNED TO BUREAU OF RESEARCH AND STATISTICS
BY OCTOBER 1, 1963

SYMBOL _____
(For State Agency Use)
CONFIDENTIAL
(Follow Attached Instructions)

LINE NUMBER	SECTION B. (CONTINUED) OCCUPATIONAL TITLES	SEPT. 1961 EMPLOYMENT	CURRENT EMPLOYMENT		EXPANSION NEEDS				REPLACEMENT NEEDS				NUMBER EXPECTED TO COMPLETE IN-PLANT TRAINING IN SEPT. 1965-SEPT. 1968	
					SEPTEMBER 1965		SEPTEMBER 1968		SEPTEMBER 1965		SEPTEMBER 1968			
			TOTAL	FEMALE	TOTAL	FEMALE	TOTAL	FEMALE	TOTAL	FEMALE	TOTAL	FEMALE	TWO YEARS	FIVE YEARS
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
36	Electrical Appliance Serviceman													
37	Electrician													
38	First Class Metalworking Machine Hand													
39	Instrument Maker													
40	Instrument Repairman													
41	Linotype Operator													
42	Machinist													
43	Maintenance Mechanic, Building													
44	Maintenance Mechanic, Factory													
45	Meat Cutter													
46	Offset Pressman													
47	Oil Burner Installer													
48	Plumber - Pipefitter													
49	Refrigeration or Air-Conditioning Mechanic													
50	Sheet Metal Worker													
51	Stationary Engineer													
52	Tailor													
53	Tool and Die Maker													
54	Welder													
55	All Other Skilled													
56														

RS-152 (8-63)

AREA SKILL SURVEY NEWARK LABOR MARKET AREA

TO BE RETURNED TO BUREAU OF RESEARCH AND STATISTICS BY OCTOBER 1, 1963

SYMBOL _____
(For State Agency Use)
CONFIDENTIAL
(Follow Attached Instructions)

LINE NUMBER	SECTION B. (CONTINUED) OCCUPATIONAL TITLES	SEPT. 1961 EMPLOYMENT	CURRENT EMPLOYMENT		EXPANSION NEEDS				REPLACEMENT NEEDS				NUMBER EXPECTED TO COMPLETE IN-PLANT TRAINING IN SEPT. 1965-SEPT. 1968	
					SEPTEMBER 1965		SEPTEMBER 1968		SEPTEMBER 1965		SEPTEMBER 1968			
			TOTAL	FEMALE	TOTAL	FEMALE	TOTAL	FEMALE	TOTAL	FEMALE	TOTAL	FEMALE	TWO YEARS	FIVE YEARS
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
57														
58	Total Lines 59 - 66													
59	Chemical Operator													
60	Fireman, Stationary Boiler													
61	Presser, Hand													
62	Presser, Machine													
63	Routeman													
64	Sewing Machine Operator													
65	All Other Semiskilled													
66														
67	Unskilled													
68	Service													
69	Cook													

EVALUATION OF OCCUPATIONAL TRAINING SURVEY
NEWARK LABOR MARKET AREA

No.

Institute of Management & Labor Relations
Rutgers - The State University
in cooperation with
Department of Labor and Industry
Division of Employment Security
New Jersey State Employment Service

To Be Returned To: Research Program
Institute of Management and Labor Relations
Rutgers - The State University
New Brunswick, N.J. 08901

CONFIDENTIAL
(Follow Attached Instructions)

LINE NUMBER	SECTION A — ALL EMPLOYMENT NUMBER OF EMPLOYEES ON ALL PAYROLLS					
	PAYROLL PERIOD ENDING ON OR NEAREST SEPTEMBER 15, 1963		PREDICTED FOR SEPTEMBER 15, 1965		ACTUAL FOR SEPTEMBER 15, 1965	
	TOTAL I	FEMALE II	TOTAL III	FEMALE IV	TOTAL V	FEMALE VI

CODE-COLUMN X
Reasons for differences between actual and expected:
A Business poorer than expected
B Business better than expected
C Technological changes
D Qualified workers not available
E Insufficient information to make accurate prediction
F Other - please specify
If more than one reason circle most important

Company _____

Name _____ Title _____
(To be signed by person completing form)

LINE NUMBER I	SECTION B — OCCUPATIONAL TITLES II	SEPT. 1961 EMPLOYMENT III	TOTAL SEPT. 15 1963 IV	FEMALE SEPT. 15 1963 V	TOTAL PREDICTED SEPT. 15 1965 VI	FEMALE PREDICTED SEPT. 15 1965 VII	TOTAL ACTUAL SEPT. 15 1965 VIII	FEMALE ACTUAL SEPT. 15 1965 IX	REASONS FOR DIFFERENCES (PER CODE ABOVE) X
1	Total Professional								
2									
3	Total Lines 4 - 12								
4	Draftsman								
5	Electronics Technician								
6	Laboratory or Chemist Assistant								
7	Nurse, Practical								
8	Programmer								
9	All Other Semiprofessional								
10									
11									
12									
13	Managerial								
14									
15									

EVALUATION OF OCCUPATIONAL TRAINING SURVEY
NEWARK LABOR MARKET AREA

(CONTINUED)

CONFIDENTIAL
(Follow Attached Instructions)

LINE NUMBER I	SECTION B, (CONTINUED) OCCUPATIONAL TITLES II	SEPT. 1961 EMPLOY-MENT III	TOTAL SEPT. 15 1963 IV	FEMALE SEPT. 15 1963 V	TOTAL PREDICTED SEPT. 15 1965 VI	FEMALE PREDICTED SEPT. 15 1965 VII	TOTAL ACTUAL SEPT. 15 1965 VIII	FEMALE ACTUAL SEPT. 15 1965 IX	REASONS FOR DIFFERENCES (PER CODE ABOVE) X
16	Total Lines 17 - 25								
17	Bookkeeper								
18	Bookkeeping Machine Operator								
19	Clerk-Typist								
20	Key Punch Operator								
21	Secretary								
22	Stenographer								
23	Tabulating Machine Operator								
24	All Other Clerical								
25									
26	Sales								
27									
28	Total Lines 29 - 57								
29	Automobile Body Repairman								
30	Automobile Mechanic								
31	Baker								
32	Brick Layer								
33	Carpenter								
34	Cutter, Hand								
35	Cylinder Pressman								

EVALUATION OF OCCUPATIONAL TRAINING SURVEY
NEWARK LABOR MARKET AREA

(CONTINUED)

CONFIDENTIAL
(Follow Attached Instructions)

LINE NUMBER	SECTION B. (CONTINUED) OCCUPATIONAL TITLES	SEPT. 1961 EMPLOY-MENT	TOTAL SEPT. 15 1963	FEMALE SEPT. 15 1963	TOTAL PREDICTED SEPT. 15 1965	FEMALE PREDICTED SEPT. 15 1965	TOTAL ACTUAL SEPT. 15 1965	FEMALE ACTUAL SEPT. 15 1965	REASONS FOR DIFFERENCES (PER CODE ABOVE)
I	II	III	IV	V	VI	VII	VIII	IX	X
36	Electrical Appliance Serviceman								
37	Electrician								
38	First Class Metalworking Machine Hand								
39	Instrument Maker								
40	Instrument Repairman								
41	Linotype Operator								
42	Machinist								
43	Maintenance Mechanic, Building								
44	Maintenance Mechanic, Factory								
45	Meat Cutter								
46	Offset Pressman								
47	Oil Burner Installer								
48	Plumber - Pipefitter								
49	Refrigeration or Air-Conditioning Mechanic								
50	Sheet Metal Worker								
51	Stationary Engineer								
52	Tailor								
53	Tool and Die Maker								
54	Welder								
55	All Other Skilled								
56									

EVALUATION OF OCCUPATIONAL TRAINING SURVEY
NEWARK LABOR MARKET AREA

CONFIDENTIAL
(Follow Attached Instructions)

LINE NUMBER I	SECTION B. (CONTINUED) OCCUPATIONAL TITLES II	SEPT. 1961 EMPLOY-MENT III	TOTAL SEPT. 15 1963 IV	FEMALE SEPT. 15 1963 V	TOTAL PREDICTED SEPT. 15 1965 VI	FEMALE PREDICTED SEPT. 15 1965 VII	TOTAL ACTUAL SEPT. 15 1965 VIII	FEMALE ACTUAL SEPT. 15 1965 IX	REASONS FOR DIFFERENCES (PER CODE ABOVE) X
57									
58	Total Lines 59 - 66								
59	Chemical Operator								
60	Fireman, Stationary Boiler								
61	Presser, Hand								
62	Presser, Machine								
63	Routeman								
64	Sewing Machine Operator								
65	All Other Semiskilled								
66									
67	Unskilled								
68	Service								
69	Cook								

APPENDIX B

Employment By Occupation and Industry for September, 1963

APPENDIX B
TABLE A

EMPLOYMENT BY OCCUPATION AND INDUSTRY FOR SEPTEMBER, 1963
PREDICTED AND ACTUAL, SEPTEMBER, 1965
(302 establishments in the Newark Labor Area)

	Manufacturing Employment			Construction Employment			Transportation Employment			Wholesale Employment			Retail Employment		
	Sept.'63	Sept.'65 Pred.	Sept.'65 Act.	Sept.'63	Sept.'65 Pred.	Sept.'65 Act.	Sept.'63	Sept.'65 Pred.	Sept.'65 Act.	Sept.'63	Sept.'65 Pred.	Sept.'65 Act.	Sept.'63	Sept.'65 Pred.	Sept.'65 Act.
Professional	2518	2645	2451	113	123	171	149	153	150	14	14	15	80	80	77
Semi-professional	2518	2684	2485	15	17	18	683	687	676	6	5	5	43	48	42
Managerial	2406	2494	2494	62	65	78	2792	2798	2864	120	117	115	773	776	779
Clerical	5372	5636	5191	55	60	87	8156	8176	8181	287	297	276	1354	1387	1346
Sales	2007	2117	2138	5	5	3	76	77	91	154	151	162	2455	2424	2224
Skilled	7090	7378	7087	383	398	512	5460	5471	5520	196	201	182	328	358	370
Semi-skilled	12377	12618	13267	22	25	17	3165	3186	3141	482	396	[illegible]	289	320	353
Unskilled	8173	8912	8658	228	256	322	782	840	775	229	238	252	904	905	866
Service	591	627	536	---	---	---	392	392	381	8	8	8	530	540	540
Cook	25	26	26	---	---	---	7	7	3	---	---	---	37	39	35
TOTAL	43077	45137	44333	883	949	1208	21662	21787	21782	1496	1427	1488	6793	6877	6632

TABLE A (Cont'd)

EMPLOYMENT BY OCCUPATION AND INDUSTRY FOR SEPTEMBER, 1963

PREDICTED AND ACTUAL, SEPTEMBER, 1965

(302 establishments in the Newark Labor Area)

	Finance Employment			Services Employment			Total Employment		
	Sept.'63	Sept.'65 Pred.	Sept.'65 Act.	Sept.'63	Sept.'65 Pred.	Sept.'65 Act.	Sept.'63	Sept.'65 Pred.	Sept.'65 Act.
Professional	554	558	506	4662	4671	5196	8090	8244	8566
Semi-professional	500	523	607	2559	2572	2631	6324	6536	6464
Managerial	788	802	728	297	307	332	7238	7359	7390
Clerical	9123	9222	9718	2854	2881	2844	27201	27659	27643
Sales	28	31	46	163	166	173	4888	4971	4837
Skilled	127	128	131	1330	1361	1251	14914	15295	15053
Semi-skilled	30	27	25	806	824	832	17171	17396	18108
Unskilled	1174	1174	909	1365	1365	1634	12855	13690	13416
Service	45	45	50	1667	1734	1614	3233	3346	3129
Cook	7	7	7	35	36	47	111	115	118
TOTAL	12376	12517	12727	15738	15917	16554	102025	104611	104724